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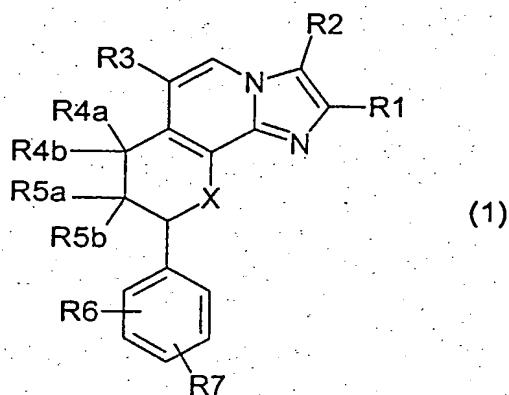
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Patent claims

## 1. A compound of the formula 1



in which

- R1 is hydrogen, 1-4C-alkyl or hydroxy-1-4C-alkyl,
- R2 is hydrogen, 1-4C-alkyl, hydroxy-1-4C-alkyl, halogen, 2-4C-alkenyl or 2-4C-alkynyl,
- R3 is hydrogen, halogen, trifluoromethyl, 1-4C-alkyl, 2-4C-alkenyl, 2-4C-alkynyl, carboxyl, -CO-1-4C-alkoxy, hydroxy-1-4C-alkyl, 1-4C-alkoxy-1-4C-alkyl, fluoro-1-4C-alkoxy-1-4C-alkyl or the radical -CO-NR<sub>3a</sub>R<sub>3b</sub>,
- one of the substituents R<sub>4a</sub> and R<sub>4b</sub> is hydrogen and the other is hydroxyl, 1-4C-alkoxy, 1-4C-alkoxy-1-4C-alkoxy, 1-4C-alkylcarbonyloxy or the radical R<sub>4'</sub>, or in which R<sub>4a</sub> and R<sub>4b</sub> together are O (oxygen),  
where R<sub>4'</sub> is a radical from which a hydroxyl group is formed under physiological conditions,
- one of the substituents R<sub>5a</sub> and R<sub>5b</sub> is hydrogen and the other is hydroxyl, 1-4C-alkoxy, 1-4C-alkoxy-1-4C-alkoxy, 1-4C-alkylcarbonyloxy or the radical R<sub>5'</sub>, or in which R<sub>5a</sub> and R<sub>5b</sub> together are O (oxygen),  
where R<sub>5'</sub> is a radical from which a hydroxyl group is formed under physiological conditions,

where

- one of the substituents R<sub>4a</sub> and R<sub>4b</sub> must have the meaning R<sub>4'</sub> and/or one of the substituents R<sub>5a</sub> and R<sub>5b</sub> must have the meaning R<sub>5'</sub>,
- R<sub>6</sub> is hydrogen, halogen, 1-4C-alkyl, 1-4C-alkoxy, 1-4C-alkoxycarbonylamino, 1-4C-alkoxy-1-4C-alkoxycarbonylamino or trifluoromethyl,

R7 is hydrogen, halogen, 1-4C-alkyl or 1-4C-alkoxy and

X is O (oxygen) or NH,

where

R3a is hydrogen, 1-7C-alkyl, hydroxy-1-4C-alkyl or 1-4C-alkoxy-1-4C-alkyl and

R3b is hydrogen, 1-7C-alkyl, hydroxy-1-4C-alkyl or 1-4C-alkoxy-1-4C-alkyl,

or where

R3a and R3b together, including the nitrogen atom to which both are bonded, are a pyrrolidino, piperidino or morpholino radical,

or its salts.

2. A compound of the formula 1 as claimed in claim 1, in which

R1 is 1-4C-alkyl;

R2 is 1-4C-alkyl or hydroxy-1-4C-alkyl,

R3 is hydrogen, halogen, carboxyl, -CO-1-4C-alkoxy, hydroxy-1-4C-alkyl, 1-4C-alkoxy-1-4C-alkyl, fluoro-1-4C-alkoxy-1-4C-alkyl or the radical -CO-NR3aR3b,

one of the substituents R4a and R4b is hydrogen and the other is hydroxyl, 1-4C-alkoxy, 1-4C-alkoxy-1-4C-alkoxy or the radical -OR', or in which R4a and R4b together are O (oxygen), one of the substituents R5a and R5b is hydrogen and the other is hydroxyl, 1-4C-alkoxy, 1-4C-alkoxy-1-4C-alkoxy or the radical -OR', or in which R5a and R5b together are O (oxygen), where one of the substituents R4a and R4b must have the meaning -OR' and/or one of the substituents R5a and R5b must have the meaning -OR',

R6 is hydrogen, halogen, 1-4C-alkyl, 1-4C-alkoxy, 1-4C-alkoxycarbonylamino, 1-4C-alkoxy-1-4C-alkoxycarbonylamino or trifluoromethyl,

R7 is hydrogen, halogen, 1-4C-alkyl or 1-4C-alkoxy and

X is O (oxygen) or NH,

where

R3a is hydrogen, 1-7C-alkyl, hydroxy-1-4C-alkyl or 1-4C-alkoxy-1-4C-alkyl and

R3b is hydrogen, 1-7C-alkyl, hydroxy-1-4C-alkyl or 1-4C-alkoxy-1-4C-alkyl,

or where

R3a and R3b together, including the nitrogen atom to which both are bonded, are a pyrrolidino, piperidino or morpholino radical,

and where

R' is selected from the group consisting of

-C(O)-NR8R9,

-C(O)-alk-NR8R9,

-C(O)-alk-C(O)-NR<sub>8</sub>R<sub>9</sub>,  
 -P(O)(OH)<sub>2</sub>,  
 -S(O)<sub>2</sub>NR<sub>8</sub>R<sub>9</sub>,  
 -C(O)-R<sub>8</sub>,  
 -C(O)-C<sub>6</sub>H<sub>3</sub>R<sub>10</sub>R<sub>11</sub>,  
 -C(O)-OR<sub>8</sub>,  
 -C(O)-alk-C(O)-R<sub>8</sub>,  
 -C(O)-alk-C(O)-OR<sub>8</sub>,  
 -C(O)-C(O)-R<sub>8</sub>,  
 -C(O)-C(O)-OR<sub>8</sub> and  
 -CH<sub>2</sub>-OR<sub>8</sub>,

where

alk is 1-7C-alkylene,

R<sub>8</sub> is hydrogen, 1-10C-alkyl or 1-4C-alkyl substituted by halogen, carboxyl, hydroxyl, sulfo (-SO<sub>3</sub>H), sulfamoyl (-SO<sub>2</sub>NH<sub>2</sub>), carbamoyl (-CONH<sub>2</sub>), 1-4C-alkoxy or 1-4C-alkoxycarbonyl,

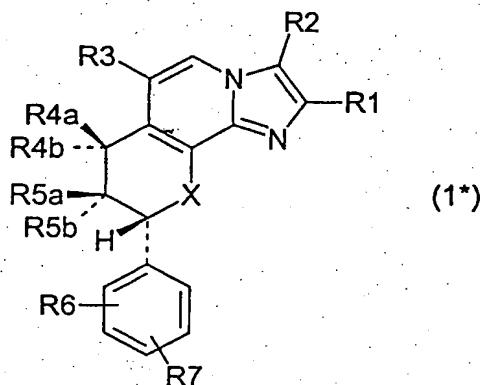
R<sub>9</sub> is hydrogen or 1-4C-alkyl,

R<sub>10</sub> is hydrogen, halogen, nitro, 1-4C-alkyl, 1-4C-alkoxy, 1-4C-alkoxycarbonyl, 1-4C-alkoxycarbonylamino, 1-4C-alkoxy-1-4C-alkoxycarbonylamino or trifluoromethyl und

R<sub>11</sub> is hydrogen, halogen, 1-4C-alkyl or 1-4C-alkoxy.

or its salts.

### 3. A compound as claimed in claim 1, having the formula 1'



in which

R<sub>1</sub> is 1-4C-alkyl,  
 R<sub>2</sub> is 1-4C-alkyl,

R3 is hydrogen, chlorine, fluorine, hydroxymethyl, difluoromethoxymethyl or the radical -CO-NR3aR3b,

one of the substituents R4a and R4b is hydrogen and the other is hydroxyl, 1-4C-alkoxy, 1-4C-alkoxy-1-4C-alkoxy or the radical -OR', or in which R4a and R4b together are O (oxygen),

one of the substituents R5a and R5b is hydrogen and the other is hydroxyl, 1-4C-alkoxy, 1-4C-alkoxy-1-4C-alkoxy or the radical -OR', or in which R5a and R5b together are O (oxygen), where one of the substituents R4a and R4b must have the meaning -OR' and/or one of the substituents R5a and R5b must have the meaning -OR',

R6 is hydrogen,

R7 is hydrogen and

X is O (oxygen) or NH,

where

R3a is hydrogen, 1-4C-alkyl, hydroxy-1-4C-alkyl or 1-4C-alkoxy-1-4C-alkyl and

R3b is hydrogen, 1-4C-alkyl, hydroxy-1-4C-alkyl or 1-4C-alkoxy-1-4C-alkyl,

and where

R' is selected from the group consisting of

-C(O)-NR8R9,

-C(O)-alk-NR8R9,

-C(O)-alk-C(O)-NR8R9,

-P(O)(OH)<sub>2</sub>,

-S(O)<sub>2</sub>NR8R9,

-C(O)-R8,

-C(O)-C<sub>6</sub>H<sub>5</sub>R10R11,

-C(O)-OR8,

-C(O)-alk-C(O)-OR8,

-C(O)-C(O)-OR8 and

-CH<sub>2</sub>-OR8,

where

alk is 1-7C-alkylene,

R8 is hydrogen, 1-10C-alkyl or 1-4C-alkyl substituted by carboxyl or sulfo (-SO<sub>3</sub>H),

R9 is hydrogen or 1-4C-alkyl,

R10 is hydrogen, halogen, nitro, 1-4C-alkyl, 1-4C-alkoxy, 1-4C-alkoxycarbonyl, 1-4C-alkoxycarbonylamino, 1-4C-alkoxy-1-4C-alkoxycarbonylamino or trifluoromethyl and

R11 is hydrogen, halogen, 1-4C-alkyl or 1-4C-alkoxy,

or its salts of the compounds.

4. A compound as claimed in claim 1, which has the formula 1\* in claim 3,

in which

R1 is methyl,

R2 is methyl,

R3 is hydrogen, chlorine, fluorine, hydroxymethyl, difluoromethoxymethyl or the radical -CO-NR3aR3b,

one of the substituents R4a and R4b is hydrogen and the other is 1-4C-alkoxy or 1-4C-alkoxy-1-4C-alkoxy,

one of the substituents R5a and R5b is hydrogen and the other is the radical -OR',

R6 is hydrogen,

R7 is hydrogen and

X is O (oxygen) or NH,

where

R3a is hydrogen, methyl, ethyl, propyl, 2-hydroxyethyl or 2-methoxyethyl and

R3b is hydrogen, methyl or ethyl,

and where

R' is selected from the group consisting of

-C(O)-NR8R9,

-C(O)-alk-NR8R9,

-C(O)-alk-C(O)-NR8R9,

-P(O)(OH)<sub>2</sub>,

-S(O)<sub>2</sub>NR8R9,

-C(O)-R8,

-C(O)-C<sub>6</sub>H<sub>5</sub>R10R11,

-C(O)-OR8,

-C(O)-alk-C(O)-OR8,

-C(O)-C(O)-OR8 and

-CH<sub>2</sub>-OR8;

where

alk is 1-7C-alkylene,

R8 is hydrogen, 1-10C-alkyl or 1-4C-alkyl substituted by carboxyl or sulfo (-SO<sub>3</sub>H),

R9 is hydrogen or 1-4C-alkyl,

R10 is hydrogen, halogen, nitro, 1-4C-alkyl, 1-4C-alkoxy, 1-4C-alkoxycarbonyl or trifluoromethyl and

R11 is hydrogen or halogen,  
or the salts of the compound.

5. A compound as claimed in claim 4, in which R' has the meaning -C(O)-N(CH<sub>3</sub>)<sub>2</sub>, -C(O)-N(C<sub>2</sub>H<sub>5</sub>)<sub>2</sub>, -C(O)-NHC<sub>2</sub>H<sub>5</sub>, -C(O)-CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>, -C(O)-(CH<sub>2</sub>)<sub>3</sub>NH<sub>2</sub>, -C(O)-C(CH<sub>3</sub>)<sub>2</sub>NH<sub>2</sub>, -C(O)-CH<sub>2</sub>N(CH<sub>3</sub>)<sub>2</sub>, -C(O)-CH(NH<sub>2</sub>)-CH(CH<sub>3</sub>)<sub>2</sub>, -C(O)-CH(NH<sub>2</sub>)CH(CH<sub>3</sub>)C<sub>2</sub>H<sub>5</sub>, -C(O)-(CH<sub>2</sub>)<sub>6</sub>C(O)N(CH<sub>3</sub>)CH<sub>2</sub>CH<sub>2</sub>SO<sub>3</sub>H, -P(O)(OH)<sub>2</sub>, -S(O)<sub>2</sub>NH<sub>2</sub>, -C(O)-H, -C(O)-C(CH<sub>3</sub>)<sub>3</sub>, -C(O)-CH<sub>2</sub>CH<sub>2</sub>COOH, -C(O)-CH<sub>3</sub>, -C(O)-C<sub>2</sub>H<sub>5</sub>, -C(O)-CH<sub>2</sub>OCH<sub>3</sub>, -C(O)-C<sub>6</sub>H<sub>5</sub>, -C(O)-C<sub>6</sub>H<sub>4</sub>-4-NO<sub>2</sub>, -C(O)-C<sub>6</sub>H<sub>4</sub>-3-NO<sub>2</sub>, -C(O)-C<sub>6</sub>H<sub>4</sub>-4-OCH<sub>3</sub>, -C(O)-C<sub>6</sub>H<sub>4</sub>-4-C(O)-OCH<sub>3</sub>, -C(O)-OCH<sub>3</sub>, -C(O)-O-menthyl, -C(O)-CH<sub>2</sub>C(O)-OCH<sub>3</sub>, -C(O)-CH<sub>2</sub>CH<sub>2</sub>C(O)-OCH<sub>3</sub>, -C(O)-C(O)-OCH<sub>3</sub>, -C(O)-OC<sub>2</sub>H<sub>5</sub> or -CH<sub>2</sub>OCH(CH<sub>3</sub>)<sub>2</sub>.

6. A compound as claimed in claim 1, which has the formula 1\* in claim 3, in which

R1 is methyl,

R2 is methyl,

R3 is hydrogen, chlorine, fluorine, hydroxymethyl, difluoromethoxymethyl or the radical -CO-NR<sub>3a</sub>R<sub>3b</sub>,

one of the substituents R<sub>4a</sub> and R<sub>4b</sub> is hydrogen and the other is 1-4C-alkoxy or 1-4C-alkoxy-1-4C-alkoxy,

R<sub>5a</sub> is the radical -OR',

R<sub>5b</sub> is hydrogen,

R<sub>6</sub> is hydrogen,

R<sub>7</sub> is hydrogen and

X is O (oxygen) or NH,

where

R<sub>3a</sub> is hydrogen, methyl, ethyl, propyl, 2-hydroxyethyl or 2-methoxyethyl and

R<sub>3b</sub> is hydrogen, methyl or ethyl,

and where

R' is selected from the group consisting of

-C(O)-NR<sub>8</sub>R<sub>9</sub>,

-C(O)-alk-NR<sub>8</sub>R<sub>9</sub>,

-C(O)-R<sub>8</sub>

-C(O)-C<sub>6</sub>H<sub>3</sub>R<sub>10</sub>R<sub>11</sub>,

-C(O)-OR<sub>8</sub>,

-C(O)-alk-C(O)-OR8, and

-C(O)-C(O)-OR8,

where

alk is 1-4C-alkylene,

R8 is hydrogen, 1-10C-alkyl or 1-4C-alkyl substituted by 1-4C-alkoxy,

R9 is hydrogen or 1-4C-alkyl,

R10 is hydrogen, halogen, nitro, 1-4C-alkyl, 1-4C-alkoxy, 1-4C-alkoxycarbonyl or trifluoromethyl and

R11 is hydrogen or halogen,

or its salts.

7. A compound as claimed in claim 1, which has the formula 1\* in claim 3,

in which

R1 is methyl,

R2 is methyl,

R3 is hydrogen,

one of the substituents R4a and R4b is hydrogen and the other is 1-4C-alkoxy or 1-4C-alkoxy-1-4C-alkoxy,

R5a is the radical -OR',

R5b is hydrogen,

R6 is hydrogen,

R7 is hydrogen and

X is O (oxygen) or NH,

where

R' is selected from the group consisting of

-C(O)-NR8R9,

-C(O)-alk-NR8R9,

-C(O)-R8

-C(O)-C<sub>6</sub>H<sub>5</sub>R10R11,

-C(O)-OR8,

-C(O)-alk-C(O)-OR8, and

-C(O)-C(O)-OR8,

where

alk is 1-4C-alkylene,

R8 is hydrogen, 1-10C-alkyl or 1-4C-alkyl substituted by 1-4C-alkoxy,

R9 is hydrogen or 1-4C-alkyl,

R10 is hydrogen, nitro, 1-4C-alkoxy or 1-4C-alkoxycarbonyl and

R11 is hydrogen,

or its salts.

8. A compound as claimed in claim 7, in which R' has the meaning -C(O)-N(CH<sub>3</sub>)<sub>2</sub>, -C(O)-N(C<sub>2</sub>H<sub>5</sub>)<sub>2</sub>, -C(O)-NH-C<sub>2</sub>H<sub>5</sub>, -C(O)-CH<sub>2</sub>N(CH<sub>3</sub>)<sub>2</sub>, -C(O)-H, -C(O)-CH<sub>3</sub>, -C(O)-C<sub>2</sub>H<sub>5</sub>, -C(O)-CH<sub>2</sub>OCH<sub>3</sub>, -C(O)-C<sub>6</sub>H<sub>5</sub>, -C(O)-C<sub>6</sub>H<sub>4</sub>-4-NO<sub>2</sub>, -C(O)-C<sub>6</sub>H<sub>4</sub>-3-NO<sub>2</sub>, -C(O)-C<sub>6</sub>H<sub>4</sub>-4-OCH<sub>3</sub>, -C(O)-C<sub>6</sub>H<sub>4</sub>-4-C(O)-OCH<sub>3</sub>, -C(O)-OCH<sub>3</sub>, -C(O)-O-menthyl, -C(O)-CH<sub>2</sub>-C(O)-OCH<sub>3</sub>, -C(O)-CH<sub>2</sub>CH<sub>2</sub>-C(O)-OCH<sub>3</sub>, -C(O)-C(O)-OCH<sub>3</sub> or -C(O)-C(O)-OC<sub>2</sub>H<sub>5</sub>.

9. A medicament comprising a compound as claimed in claim 1 and/or a pharmacologically tolerable salt thereof together with customary pharmaceutical excipients and/or vehicles.

10. The use of compounds as claimed in claim 1 and their pharmacologically tolerable salts for the prevention and treatment of gastrointestinal diseases.